

EEI-KOLLOQUIUM

SUBSTRATE INTEGRATED CIRCUITS (SICs) – A PARADIGM FOR FUTURE GHz AND THz ELECTRONIC AND PHOTONIC SYSTEMS

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Mittwoch, der 23.06.2010, 13⁰⁰ Uhr (Sondertermin)

Cauerstraße 9, Seminarraum 4.14

Diskussionsleitung: Prof. Dr.-Ing. R. Weigel

Widespread applications and commercial success of future GHz and THz electronic and photonic devices and systems including RF, microwaves and millimeter-waves are closely related to their manufacturing cost and circuit integration. Our proposed integration technologies of planar and non-planar structures as well as related new progress indicate that the emerging substrate integrated circuits (SICs) are able to provide unprecedented advantages for developing low-cost GHz/THz components, systems and wireless photonic applications. This talk reviews the state-of-the-art and underlying features of the proposed integration platforms for designing the next generation RF/millimeter-wave ICs and systems. Challenging issues and future directions are discussed for research and developments. Potential problems and possible solutions are also presented. It is believed that the newly proposed concept of SICs will offer a potentially cost-effective and performance-promising solution for mass commercial applications. With the development of innovative fabrication processes and material synthesis techniques, unique hybrid and monolithic high-density 3-D integration of planar and non-planar structures (or system-on-substrate approach) become realizable. It can also be demonstrated that this scheme of SICs may be able to effectively bridge the gap between electronics and photonics. In this presentation, our current research activities and future RF/millimeter-wave research directions will be discussed.